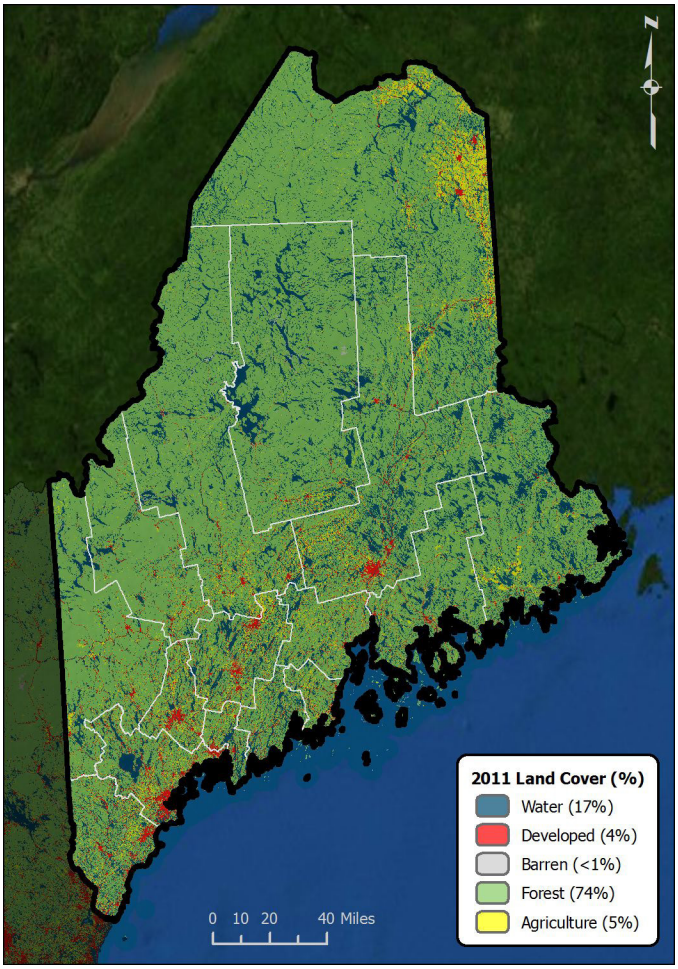
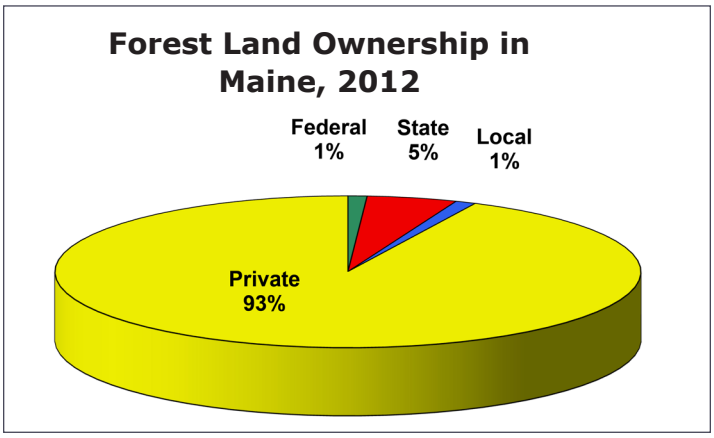
2014 Forest Health highlights

MAINE

Forest Resource Summary

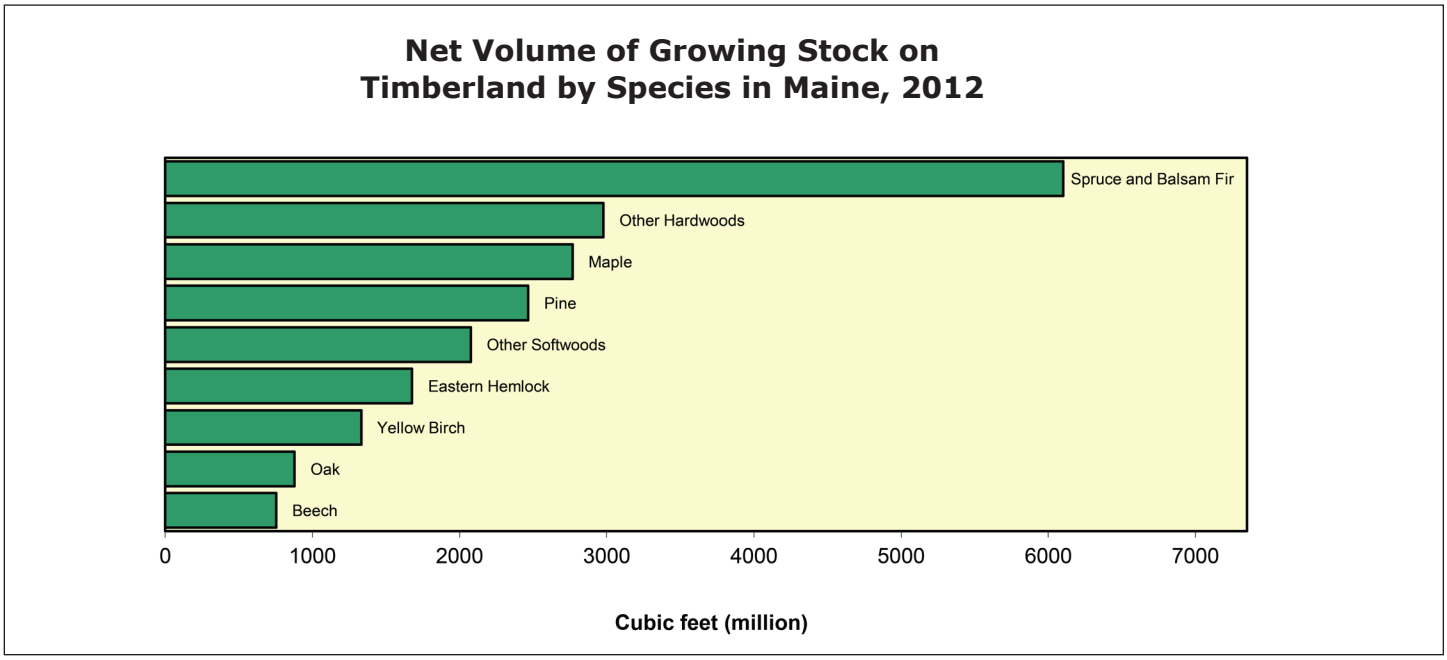
Ownership of Maine's forested land has remained stable since 1960. Almost all—approximately 93 percent—of the State's forest lands are privately owned, the majority being commercial timberland. Public ownership, including some reserved lands, has remained below 8 percent of the total forested area. The 1 percent that is federally owned encompasses the eastern portion of the White Mountain National Forest, most of which is in New Hampshire, and Acadia National Park. The latest Maine forest inventory estimated that there are approximately 17.6 million forested acres in the State. The forest resource is made up of a variety of forest species, over half of which is spruce and balsam fir; the other half is made up of maples, pines, hemlock, birch, beech, oak, and other hardwoods and softwoods.





Forest Health Programs in the Northeast

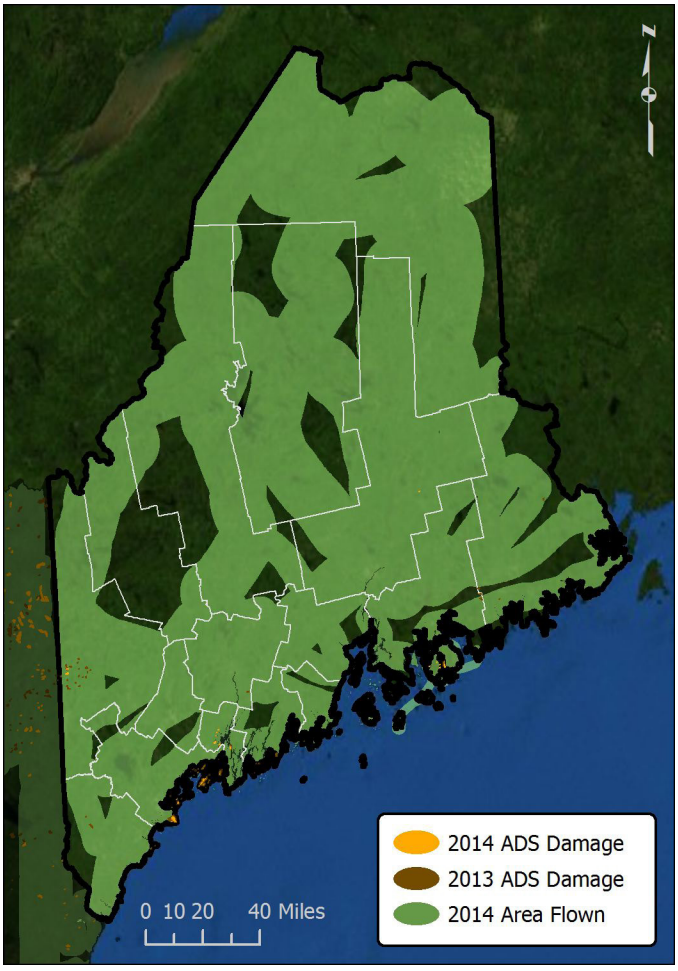
State forestry agencies work in partnership with the U.S. Forest Service to monitor forest conditions and trends in their State and respond to pest outbreaks to protect the forest resource.



Maine's forests provide much of the raw materials to fuel the State's mills and serve as the backdrop for the recreation industry. The State's forests also provide watershed, environmental, wildlife, and recreational benefits. Forested parks and individual shade trees provide similar amenities in urban and suburban settings.

Aerial Surveys

Aerial detection surveys were flown over 17.3 million acres in Maine. About 3,000 acres of damage were mapped, more than half of which was defoliation from winter moth in Cumberland County. There were about 400 acres of oak defoliation in Cumberland and Sagadahoc Counties and nearly 400 acres of red pine mortality from red pine scale in Hancock County. There were a few other minor damage types mapped, including only 8 acres of defoliation from gypsy moth in Aroostook County and about 8 acres of mortality from hemlock woolly adelgid in the southeastern area of the State.



Aerial Detection Survey (ADS) results for Maine in 2013 and 2014.

Forest Damage

Diseases

Caliciopsis Canker of White Pine

The U.S. Forest Service conducted a multistate survey of the extent and severity of *Caliciopsis* canker on white pine during the 2014 field season. The survey in Maine included examinations of white pines in 22 stands across the southern and central range of white pine in the State. Stands randomly selected for sampling from public ownership tracts (20) and Forest Inventory plots (2) were 5 acres or larger and had 75 percent or greater basal area per acre in white pine. In each stand, 100 trees were examined for symptoms and signs of the pathogen. No symptoms or signs of *Caliciopsis* canker were found in two of the stands; three stands had *C. pinea* fruiting on the understory, but no symptoms on overstory trees; four stands had symptomatic overstory trees, but no fruiting of the pathogen was evident; and 13 stands had overstory trees with symptoms and with fruiting of the pathogen confirmed on white pine regeneration. The disease appears to be widespread and common throughout the range of white pine in central and southern Maine. Studies are now underway to determine damage and economic impact of *Caliciopsis* canker in the surveyed region, which includes Maine, New Hampshire, and Massachusetts.

Internodal pitch streaks on the bark of white pine, a symptom of infection by Caliciopsis pinea*, in Limington, ME. (Photo: Maine Forest Service)*

European Larch Canker

Survey work continued for European larch canker in the quarantine buffer towns and in towns located between the two principal Maine quarantine zones along the mid-coast. No new locations of European larch canker were identified in the 2014 survey. A final remeasurement of a long-term study plot of disease intensification in Deblois (Washington County) was completed. Maine provided assistance with a European larch canker research effort to cooperators at the

A young eastern larch has multiple stem cankers of Lachnellula willkommii *at its branch whorls in Addison, ME. (Photo: Maine Forest Service)*

Laurentian Forestry Centre, Quebec, Canada. Results of the 14-year study will be presented in a summary report in 2015. *Lachnellula willkommii* samples were collected from within quarantine areas in Maine for the studies. The material was subjected to procedures that allow identification of the pathogen in wood samples in the absence of pathogen fruiting. The methods are being used to develop a possible early-detection survey technique for the disease.

Sirococcus Shoot Blight

Sirococcus shoot blight remains a significant threat to red pine in native and plantation stands throughout the State. This year, heavy infection levels and mortality were diagnosed from Chase Stream, Upper Enchanted, and Mayfield Townships (Somerset County). Additional reports have included Harrington (Washington County), Presque Isle (Aroostook County), and Northeast Harbor (Hancock County). This damage has been attributed to *Sirococcus* and tentatively to *S. conigenus*. A sample of what was believed to be *Sirococcus piceicola* was received from Mars Hill (Aroostook County) on ornamental white spruce. *S. piceicola* has apparently been found recently in Canada and elsewhere infecting red pine as a host, as well as spruce.

White Pine Needle Cast and Needle Blight

The needle disease complex that has resulted in extensive premature needle shedding in white pines over the past several years continued at a similar level of intensity in 2014. Several fungi, including *Lecanosticta acicola*, *Lophophacidium dooksii*, *Bifusella linearis*, and others have been associated with needle loss of second-year (one-year-old) needles. This is believed to be the eighth consecutive year of heavy needle loss in Maine from this disease complex. The disease remains widespread but most severe

Sirococcus *shoot blight is affecting this young red pine plantation in Frenchville, ME. (Photo: Maine Forest Service)*

This white pine stand serves as a location for environmental monitoring for incidence and severity of the white pine needle disease complex in Howland, ME. (Photo: Maine Forest Service)

throughout central, western, and southern Maine. An extensive survey in the Downeast and northern regions of Maine indicated disease presence wherever white pine was found (samples are currently being analyzed at the University of New Hampshire), but disease intensity in these regions was judged to be considerably less than in southern and western areas.

Insects

Spruce Budworm

Spruce budworm (*Choristoneura fumiferana*) is a periodic major pest of fir and spruce in Maine. The Maine Forest Service has been monitoring this insect since the early part of the last century. Since 1992 we have been using pheromone traps; catches have averaged less than 5 moths per trap across the northern part of the State. In 2011, that average crept up to over 5 moths per trap, and last year it went up to 18.5 moths per trap. In 2014 the trap catch is up again in permanent sites to 25.0 moths per trap with 97 percent of the sites having some number of moths. The highest counts are in northern-most Aroostook County near the Canadian border.

A spruce budworm pheromone trap hangs from a tree. (Photo: Maine Forest Service)

In 2014, the Maine Forest Service asked large landowners and managers in northern Maine to help survey for spruce budworm by setting out pheromone traps on their lands. We requested one 3-trap sample per 6-mile-square township set in at least a 25-acre spruce/fir stand that was composed of >50 percent spruce/fir pole-sized or larger trees. Twenty-one entities participated in setting out over 1,200 traps at 411 sites. In this set of traps, which included the long-term monitoring sites, the trend was the same. The overall average was 15.6 moths per trap with 93 percent of the traps being positive for spruce budworm (table 1). The townships with the most moths are still in northern Aroostook County.

Table 1. 2014 Spruce Budworm Moth Trapping in Northern Maine

County	Ave. No. Spruce Budworm Moths/Trap
Aroostook	25.89
Franklin	0.85
Hancock	2.36
Oxford	1.06
Penobscot	6.31
Piscataquis	10.94
Somerset	12.31
Washington	3.20
Total Average	15.57

No spruce budworm was detected either in ground or aerial surveys. Light damage in townships that had over 100 moths per trap is possible in 2015. Maine is poised at the beginning of another spruce budworm outbreak. Outbreaks occur on a roughly 40-year cycle in response to maturing forest stands and reduced pressure from parasites; the last time budworm was a problem in Maine was in the 1970s and 80s.

Emerald Ash Borer

During 2014, emerald ash borer (*Agrilus planipennis*) has been found ever closer to the borders of Maine. A quarantined county in New Hampshire is currently adjacent to our border. Multitier detection efforts continued throughout the year. Detection survey components include using purple panel traps and trap trees, biosurveillance with a native wasp, and outreach to the public.

Trap tree program volunteers learned about emerald ash borer and helped process bole sections. (Photo: Maine Forest Service)

The Maine Forest Service coordinated Maine's participation in the national emerald ash borer survey with purple panel traps. Approximately 610 traps were hung in ash trees throughout the State. All traps have been retrieved and were negative.

Several private volunteers joined personnel from several municipal, State, and Federal agencies to girdle 31 trap trees throughout the State. The trees were felled in early 2014, and 251 3-foot bolts were peeled and examined for emerald ash borer galleries at workshops hosted by the Maine Forest Service. No sign of emerald ash borer was detected. In the spring of 2014, over 23 ash trees were girdled in high-risk areas. These will be felled and peeled in early 2015.

Biosurveillance using *Cerceris fumipennis* was carried out at 25 locations throughout Maine. Thirty-five colonies were visited, but many were too small for effective biosurveillance. No emerald ash borer beetles were found.

Red Pine Scale

The invasive red pine scale (*Matsucoccus matsumurae*) was detected in Mount Desert, Hancock County, Maine, in 2014. A gardener who had observed and was concerned about the die-off of more than 100 red pines (*Pinus resinosa*) along Sargeant Drive in Mount Desert submitted a sample to the Maine Forest Service. She had noted that the intermixed pitch pine were unaffected. In a followup visit to a forested stand, the scale was readily detected once live red pine trees were encountered.

Dead and dying red pine trees are visible in the forests along Somes Sound in Mount Desert, Maine. (Photo: Maine Forest Service)

It appears the insect is well established in Mount Desert and has contributed to significant red pine mortality there. The Maine Forest Service staff has been responding to concerns regarding red pine decline and mortality in that area for a number of years. Significant disease symptoms have been observed in Mount Desert. This is the first time the insect has been encountered on submitted or gathered samples and in field visits. However, it is not likely that this is a new introduction. Little is yet known about red pine scale occurrence in Maine.

Winter Moth

Winter moth (*Operophtera brumata*) again defoliated significant areas of forest and backyard trees in Maine in 2014. Aerial survey picked up defoliation in the Cumberland County towns of Cape Elizabeth, Portland (Peaks Island), and Harpswell, with just less than 1,900 acres mapped. On the ground, light to severe defoliation could be seen in scattered locations from Kittery to Rockland.

A first instar winter moth larva is pictured on an expanding maple bud. (Photo: Maine Forest Service)

Parasitic flies (*Cyzenis albicans*) were released for the second year in Maine in cooperation with Dr. Joseph Elkinton, University of Massachusetts, who has been releasing the flies in New England with funding from the USDA. In 2014, a total of 4,400 flies were released in three towns (table 2). Students from Harpswell Coastal Academy and the Vinalhaven Vital Signs program each assisted in a release this year.

Outreach about this pest has been focused on alerting people to the risk of spread in soil and on transplants.

Table 2. 2014 *Cyzenis albicans* parasitic fly releases in Maine.

Town	County	Dates	Number of flies
Kittery	York	May 16 & 23, 2014	1,200
Harpswell	Cumberland	May 16 & 22, 2014	1,200
Vinalhaven	Knox	May 21, 2014	2,000

References

Land Cover Map:

Jin, S.; Yang, L.; Danielson, P.; Homer, C.; Fry, J.; Xian, G. 2013. A comprehensive change detection method for updating the National Land Cover Database to circa 2011. Remote Sensing of Environment. 132: 159–175.

Forest Land Area by Ownership:

Oswalt, Sonja N.; Smith, W. Brad; Miles, Patrick D.; Pugh, Scott A. 2014. Forest resources of the United States, 2012: a technical document supporting the Forest Service 2015 update of the RPA Assessment. Gen. Tech. Rep. WO–91. Washington, DC: U.S. Department of Agriculture, Forest Service, Washington Office. Table 2.

Net Volume of Growing Stock on Timberland by Species:

Oswalt, Sonja N.; Smith, W. Brad; Miles, Patrick D.; Pugh, Scott A. 2014. Forest resources of the United States, 2012: a technical document supporting the Forest Service 2015 update of the RPA Assessment. Gen. Tech. Rep. WO–91. Washington, DC: U.S. Department of Agriculture, Forest Service, Washington Office. Table 23 & 24.

Maine Forest Inventory:

McCaskill, George L. 2014. Forests of Maine, 2013. Resource Update FS–16. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 4 p.

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